Research Article

Depression in Patients with end Stage Renal Disease Attending Hemodialysis at Imam Al-Hussein Medical City, Karbala

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Abstract

Background: Depression is a common psychological condition among patients with end-stage renal disease (ESRD) on hemodialysis because of chronic dependence on the hemodialysis machine for life, but it is unrecognized and underestimated. The experience of multiple losses in kidney function, family role, time, money, and work, in addition to the fear of death, all of which negatively affect the patient's mood and life. This study aims to determine the prevalence of depression among patients with ESRD on hemodialysis and factors associated with it.

Methods: A cross-sectional study was done in the hemodialysis unit in Imam AL Hussein Medical City in Karbala from 1st April 2024 to 30th June 2024 involving patients with ESRD on hemodialysis. Samples were collected consecutively from patients above 18 years old through direct interview using a semistructured questionnaire based on the Patient Health Questionnaire (PHQ-9) scale.

Results: Three hundred hemodialyzed patients were interviewed, among whom 59.3% were males and the remainder were females. The mean age of participants was 51.59 years. The prevalence of depression was 67%. A significant association was found between divorced, widowed, or not working patients and depression. Regarding PHQ-9, feeling of sadness was the most common symptom among participants at 82%.

Conclusions: Nearly two-thirds of patients with ESRD undergoing hemodialysis experienced depression, which was significantly associated with widowhood, divorce, and unemployment. Regular depression screening every 6–12 months is recommended, and future longitudinal, multicenter studies are warranted to clarify the predictors and outcomes of depression in this population.

Keywords: Depression, End-stage renal diseases, Haemodialysis, PHQ-9, chronic kidney diseases

Introduction

Depression is a common mental health disorder that can affect anyone, especially individuals exposed to abuse, loss, or stressful life events. It impacts all aspects of life, including family, social, and community relationships, and can both result from and lead to trauma [1]. Depression is characterized by persistent sadness or a loss of interest lasting at least two weeks. It is often accompanied by fatigue, changes in appetite, sleep disturbances, poor concentration, feelings of worthlessness or hopelessness, and thoughts of self-harm or suicide. Globally, about 3.8% of the population, approximately 280 million people, are affected by depression, with over 700,000 deaths by suicide each year [1-2].

In Iraq, limited data exist, but one study estimated a prevalence of 7.4%, affecting around 475,000 individuals annually [3]. Chronic Kidney Disease (CKD) is defined as a progressive loss of kidney function lasting more than three months. Globally, end-stage renal disease affects up to 10% of the population and is projected to become the fifth leading cause of death by 2040 [4].

Over the last three decades, End Stage Renal Disease (ESRD) incidence increased by 88%, prevalence by 87%, mortality by 98%, and disability-adjusted life years by 62%, mainly due to the rising rates of non-communicable diseases like diabetes

and hypertension In the Middle East, chronic kidney disease prevalence ranges from 4.9% to 12.2%, with a median of 8.2% [5-6]. The Iraqi Ministry of Health reported a 20% annual increase in chronic kidney disease patients requiring hemodialysis (HD), which makes it now the sixth leading cause of death [7].

Depression is the most common psychological disorder among patients with ESRD undergoing hemodialysis, with prevalence rates between 20% and 90%, depending on the population and assessment tools used. In these patients, depression is up to three times more prevalent than in the general population. It is often triggered by the burden of chronic illnesses, frequent hospitalizations, failed transplants, insomnia, and persistent fatigue [4, 8-9]. Diagnosis of depression in patients with ESRD is difficult due to symptom overlap with uremia, including sleep disturbances, appetite changes, and fatigue. As a result, depression is often underdiagnosed and untreated, leading to poorer outcomes [10].

Studies have shown that depressive symptoms are associated with a faster decline in kidney function, more rapid progression to end-stage renal disease, and increased mortality. Additionally, depression contributes to an elevated cardiovascular risk, which is already the leading cause of death among dialysis patients. Hemodialysis imposes a substantial psychological and physical burden on both patients and their families, negatively affecting quality of life and increasing dependency, financial strain, and social isolation. Moreover, the side effects of medications, strict dietary restrictions, metabolic changes, and fear of death further exacerbate mental health challenges [11-14].

Several therapeutic interventions, including pharmacological treatment, cognitive-behavioral therapy, exercise programs, especially intradialytic exercise, relaxation techniques, spiritual and social support, and patient education, can significantly reduce depression levels. Implementing routine depression screening for end-stage renal disease patients is crucial to identify and address this common comorbidity early, reduce stigma, and promote better communication between patients and healthcare providers [15-16].

This study aims to determine the prevalence of depression among patients with ESRD on hemodialysis and its relationship with sociodemographic characteristics.

Materials and Methods

Study design and setting

An analytic cross-sectional study was done in a haemodialysis unit in Imam AL Hussein Medical City in Karbala Governorate in the center of Iraq involving patients with ESRD on HD. 300 samples were selected in a consecutive way from this group of patients above 18 years old. The data collection was conducted from 1st April 2024 to 30th June 2024.

Sample collection

A total of 317 patients with chronic renal failure undergoing hemodialysis were invited to participate in the study. Seventeen patients declined participation from the outset, resulting in a final sample of 300 participants. This corresponds to a response rate of 95%, based on a total of 610 patients registered in the hemodialysis unit. Sample collection began after obtaining approval from the health institution where the study was conducted. Participants were recruited consecutively. The purpose and procedures of the study were thoroughly explained to each participant, who then provided verbal consent. They were also informed of their right to withdraw from the study at any time without any negative consequences.

Face-to-face interviews were conducted by the primary researcher. Some patients declined participation due to fatigue, advanced age, or a lack of interest. Patients in the hemodialysis unit were organized into various groups and scheduled on alternate days. The center operates morning, afternoon, and night shifts, while Fridays are reserved for emergency cases only. Each hemodialysis session lasts approximately four hours. The sample was obtained by attending the morning and afternoon shifts on two consecutive days each week. All patients present during those sessions were invited to participate, except those who refused.

Inclusion criteria

All patients with end-stage renal failure on hemodialysis above 18 years old were included in this study.

Exclusion criteria

Excluded patients were unstable or unconscious patients or tired patients, non-Iraqi patients, and patients who refused or did not have the desire to participate.

Data collection

Data were collected by direct interview. As some patients don't have basic reading and writing skills to ensure confidentiality and enhance reliability, the researcher collected data from patients.

A questionnaire was designed and selected from multiple literatures with some modifications [17-18], then reviewed by the research team, and it was

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evaluated by a specialist doctor of psychiatric medicine. Also supervisor checked the data to ensure that it had been gathered and saved properly. The questionnaire was designed to include 26 questions divided into three parts: the first part included questions about personal and sociodemographic data, which included age, gender, marital status, education level, occupational level, monthly income, current address, past medical history, and smoking (nine questions).

The second part of the question was about end-stage renal disease and hemodialysis sessions, including the duration of the disease, the frequency of dialysis sessions per week, the duration of dialysis sessions, complications during or after the session, the method of dialysis, and whether renal failure is a post-COVID infection. It also asked if there are relatives or caregivers who came with patients to dialysis sessions (seven questions).

Scoring system

By using PHQ-9, patients were asked to rate how frequently they were bothered by specific problems in the preceding two weeks. Four alternative responses were assigned per question and scored from 0 to 3 (0 = not at all, 1 = several days, 2 = more than half of the days, and 3 = nearly every day). Accordingly, the total score ranged from 0 to 27, with higher scores representing more severe depression. The severity of depression was categorized based on the total score as none (0–4), mild (5–9), moderate (10–14), moderately severe (15–19), and severe (20–27).

Ethical consideration

The study was approved by the Arabic Board for Health Specialisation of Family Medicine. It was also approved by the training and human development center at the Research and Knowledge Management Division in the Karbala health directorate (Approval No. 495, dated February 13, 2024). Consent is also taken from the health institution where the study takes place, and verbal consent is taken from each patient participating in the study.

Statistical analysis

The data of the present study were entered and analyzed by using the Statistical Package for the Social Sciences (SPSS 24 and Windows). The descriptive statistics were used in terms of frequency and percentage, and mean with standard deviation (mean ±SD) in appropriate tables and graphs. A possible association between the two categorical variables was made through the chi-square test or the use of the Mann-Whitney test to compare the means between the two groups. Significance level was considered when $p < 0.05$.

Results

The study included 300 patients with chronic kidney disease, of whom 59.3% were male and the remainder were female. About one-fifth of the patients were under the age of 40, while 29.3% were aged 60 and above. The results showed that more than one-third of the patients reported having a low income, whereas only 11.3% reported a high income. Approximately one-quarter of the patients were employed (Table 1). Regarding the chronic diseases among study participants, hypertension and diabetes were the two main diseases reported (Figure 1). More than half of the study participants reported a duration of illness equal to or more than three years, and the frequency of dialysis was reported as 3-4 times of dialysis sessions per week by 60% of the study participants. Hours of dialysis were reported to be four hours per session in 61.3% of patients (Table 2). While about one quarter of the participants had no complications associated with the HD session, the highest proportion of complications was hypotension (23%), followed by hypertension and pain and muscle spasm (Figure 2).

Regarding responses to questions assessing depression severity among study participants, the results showed that more than half of the patients usually or always reported a loss of interest or pleasure in doing things and feeling sad or depressed (Table 3). As for the prevalence of depression among patients with CKD, 201 (67%) of the total study population showed mild to severe depression (Figure 3).

Regarding the association of socio-demographic characteristics with depression severity, the analysis showed a statistically significant association between marital status and depression severity (p=0.011) (Table 4). Analysis of data concluded that non-workers had a significantly higher prevalence of depression than that of workers (p=0.006) (Table 4). The association of depression and dialysis activities among study participants revealed no significant statistical association (Table 5).

Discussion

Depression among patients with ESRD on hemodialysis is a major challenge. In Iraq, as in other conservative Arab countries, cultural factors likely contribute to underdiagnosis and undertreatment. Many individuals reject referrals to a psychiatrist, viewing it as a mental issue and a source of stigma in the communityTherefore, continuous assessment and psychological support

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are essential. More than two-thirds of patients with ESRD on HD have depression, and more than a quarter of those patients have moderately severe to severe depression. This high prevalence (67%) may be slightly overestimated due to overlapping uremic symptoms, such as fatigue and sleep disturbance; the influence of PHQ-9 responses; the transient mood of the patient; and the effect of other comorbidities on the psychological aspect of patients. But despite that, the study is close to two studies done in Mosul and Al Diwaniyah cities in Iraq at 69 and 63%, respectively [9, 19], and to another two studies in Iran and Sudan with 65.8% and 68% respectively [20-21]. While this prevalence of depression is higher than studies

done in Jordan, Egypt, China, Saudi Arabia, and Morocco, with 58%, 55%, 55%, 24%, and 22%, respectively [22-26]. And lower than from studies done in Palestine 73% and Nepal (84%) [27-28]. Depression was significantly associated with being divorced or widowed, consistent with a study conducted in Al-Diwaniyah city in Iraq, which showed that the prevalence of depression is higher among divorced and widowed patients [19]. A meta-analysis study reported similar results that depression is higher in single and higher in no longer married (divorced or widowed) [29]. In line with this, a Jordanian study reported that depression was more common among single participants [22].

Table 1: Socio-demographic characteristics among study participants, N=300

| Characteristics	Categories	Frequency (%)
Age (years)	Below 40	61 (20.3)
	40-59	151 (50.4)
	60 and above	88 (29.3)
	Mean ±SD	51.59±12.94
Sex	Male	178 (59.3)
	Female	122 (40.7)
Education	Illiterate	62 (20.7)
	Primary/ read and write	144 (48.0)
	Secondary	63 (21.0)
	College and higher	31 (10.3)
Residence	Urban	218 (72.7)
	Rural	82 (27.3)
Marital status	Married	239 (79.7)
	Single	25 (8.3)
	Divorced/ widow	36 (12.0)
Economic Level	Low	103 (34.3)
	Medium	163 (54.4)
	High	34 (11.3)
Occupation	Not work	226 (75.3)
	Work	74 (24.7)
Smoking	Yes	89 (29.7)
	No	211 (70.3)
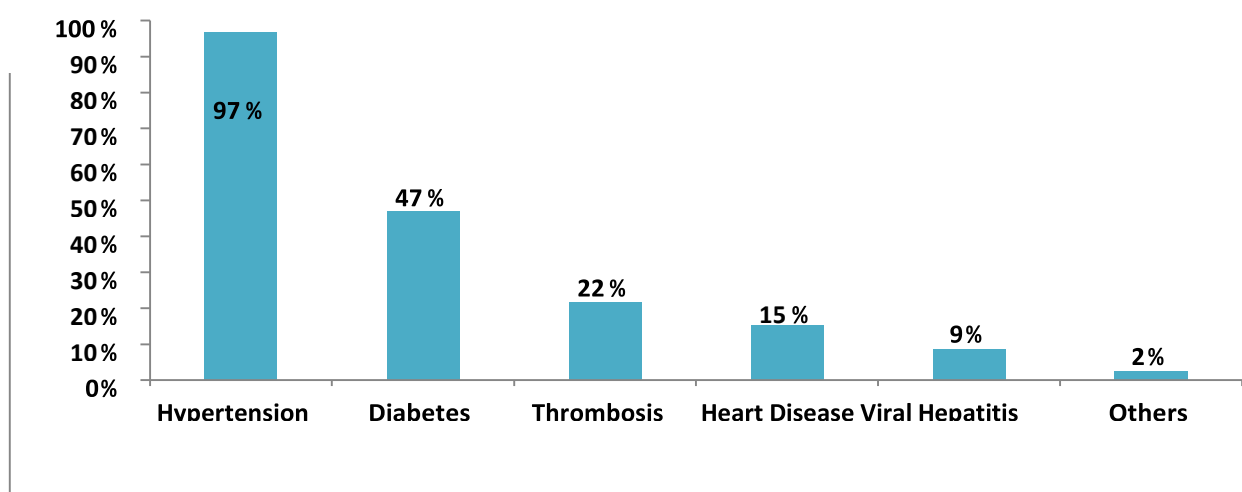
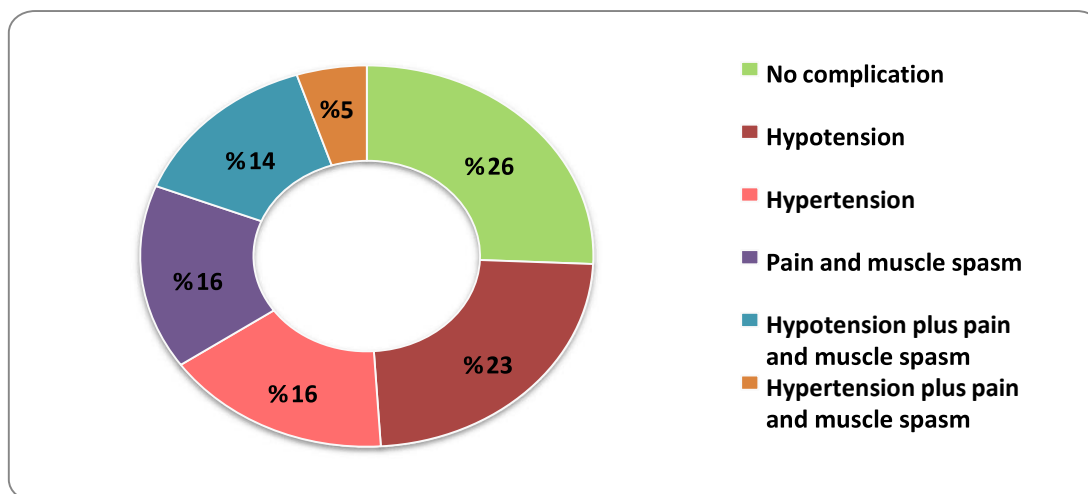**Figure 1:** Proportions of history of chronic diseases among study patients

Figure 2: Proportions of complications during, before or after dialysis among study patients.

Table 2: Frequencies and proportions of answers to questions about chronic kidney diseases among study participants, N=300

Characteristics	Categories	Frequency (%)
Duration of illness (years)	< 3 years	139 (46.3)
	≥ 3 years	161 (53.7)
	Mean± SD	3.19 ± 2.24
Frequency of dialysis/ week	1-2 times	120 (40)
	3-4 times	180 (60)
Hours of dialysis session	3 hours	116 (38.7)
	4 hours	184 (61.3)
Patients attending dialysis	Alone	75 (25)
	With relative	225 (75)

Table 3: Frequencies and proportions of answers to questions regarding assessment of depression severity among study participants.

	Questions	Never	Sometimes	Usually	Always
1	Little interest or pleasure in doing things	65 (21.7)	67 (22.3)	94 (31.3)	74 (24.7)
2	Feeling down, depressed, or hopeless	53 (17.7)	75 (25)	91 (30.3)	81 (27)
3	Difficulty falling or remaining asleep, or sleeping a lot	85 (28.3)	76 (25.3)	98 (32.7)	41 (13.7)
4	Feeling tired or having little energy	103(34.3)	97 (32.3)	73 (24.3)	27 (9)
5	Poor appetite or overeating	112(37.3)	118(39.3)	56 (18.7)	14 (4.7)
6	Feeling bad about yourself, or that you are a failure, or have let yourself or your family down	104(34.7)	100(33.3)	71 (23.7)	25 (8.3)
7	Trouble focusing on tasks such as reading the newspaper or watching television.	178(59.3)	97 (32.3)	23 (7.7)	2 (0.7)
8	Moving or speaking so slowly that other people could have noticed? Or the opposite: being so fidgety or restless that you have been moving around a lot more than usual	134(44.7)	98 (32.7)	58 (19.3)	10 (3.3)
9	Thoughts that you would be better off dead or of hurting yourself in some way	156 (52)	93 (31)	50 (16.7)	1 (0.3)
10	To what extent have these issues interfered with your ability to work, manage household responsibilities, or maintain social relationships	No difficulty at all	Somewhat difficult	Very difficult	Insuperable-difficult
		2 (0.7)	96 (32)	137 (45.6)	65 (21.7)

This goes with the fact that being married and living with family have a positive association with mental as well as general well-being [29]. Though the high prevalence of depression in divorced or widowed people might be affected by the low percentage of divorced and widowed people, it is in parallel with the population demography of Iraq. But, it may be explained that those patients lose social and emotional supports in life that are provided to other patients by their partners, and

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they also endure the responsibility of their family and children alone. In spite of this, divorce and widowhood are stressful and traumatic life events that lower psychological well-being [4, 29].

Significant association was reported between depression and occupational status of participants, and the prevalence of depression in non-workers is higher than in worker participants. and this study agrees with studies done in Yemen [17] and Egypt [13]. While other studies done in Saudi Arabia [25] and China [24] showed no significant association with working status. The high prevalence of depression in non-working individuals may be due to prolonged unemployment, which increases exposure to stress, social isolation, and the loss of work-related relationships and support. In addition, non-workers often experience economic difficulties and decreased self-esteem.

Female patients and those with lower educational levels showed a slightly higher prevalence of depression, but this was not statistically significant. Same finding for the duration of the disease. While other studies reported significant association with female sex, lower educational level, and longer duration [4, 8, 29].
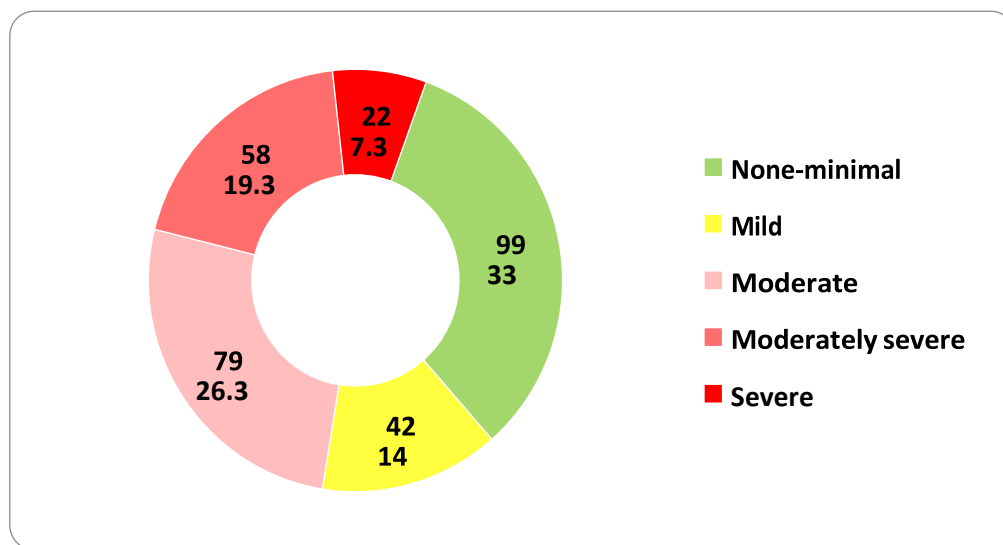

Figure 3: Proportions of depression severity among study patients

Table 4: Association of socio-demographic characteristics and depression severity among study participants, N=300

Characteristics		Prevalence of depression		p-value
		None- minimal	Mild to severe	
Sex	Male	65 (36.5%)	113 (63.5%)	0.134
	Female	34 (27.9%)	88 (72.1%)	
Age (years)	Mean ± SD	50.66 ±11.67	52.05 ±13.53	0.390
Education	Illiterate	24 (38.7%)	38 (61.3%)	0.224
	Primary	41 (28.5%)	103 (71.5%)	
	Secondary	20 (31.7%)	43 (68.3%)	
	College and higher	14 (45.2%)	17 (54.8%)	
Residence	Urban	72 (33%)	146 (67%)	0.987
	Rural	27 (32.9%)	55 (67.1%)	
Marital status	Married	85 (35.6%)	154 (64.4%)	0.011*
	Single	10 (40%)	15 (60%)	
	Divorced/ widow	4 (11.1%)	32 (88.9%)	
Economic level	Low	28 (27.2%)	75 (72.8%)	0.288
	Medium	58 (35.6%)	105 (64.4%)	
	High	13 (38.2%)	21 (61.8%)	
Occupation	Not work	65 (28.8%)	161 (71.2%)	0.006*
	Work	34 (45.9%)	40 (54.1%)	
Smoking	Yes	27 (30.3%)	62 (69.7%)	0.524
	No	72 (34.1%)	139 (65.9%)	

* Significant P-value of less than 0.05. Chi-square test or Mann-Whitney test was used as appropriate.

Table 5: Association of depression severity and dialysis among study participants, N=300.

Variables		Prevalence of depression		p-value
		None- minimal	Mild to severe	
Duration of illness (years)	Mean± SD	2.99±2.26	3.28±2.24	0.190
Frequency of dialysis (per week)	2 times	43 (35.8)	77 (64.2)	0.394
	3 times	56 (31.1)	124 (68.9)	
Hours of dialysis	3 hours	40 (34.5)	76 (65.5)	0.665
	4 hours	59 (32.1)	125 (67.9)	
The patient attends dialysis	Alone	24 (32)	51 (68)	0.832
	With relative	75 (33.3)	150 (66.7)	

* Significant p-value of less than 0.05. Chi-square test or Mann-Whitney test was used as appropriate.

Regarding the PHQ-9 scale, the most common symptom in this study was a feeling of sadness, 82.3 % but a study done in Saudi Arabia revealed loss of energy was the most common symptom [30], and feeling of fatigue is the most common symptom in a study done in Nepal [28]. Regarding associated chronic diseases, results showed that hypertension and diabetes were the two most common conditions among participants, consistent with the findings of a study conducted in Yemen [17] that reported the same finding.

Study Limitations

This study has several limitations, as a cross-sectional design prevents establishing causality between depression and related factors. Being a single-center study limits the generalizability of results. Further, the use of self-reported PHQ-9 may be affected by overlapping uremic symptoms and transient moods, possibly inflating depression rates. Furthermore, only bivariate analyses were conducted without controlling for confounders like comorbidities and the small subgroup sizes, which might have limited statistical power for some comparisons.

Conclusions

Approximately two-thirds of patients with ESRD undergoing hemodialysis in this study experienced depression, ranging from mild to severe. Depression was significantly associated with being widowed, divorced, or unemployed. However, given the cross-sectional design, potential measurement biases, overlapping symptoms of depression with those of ESRD, and the influence of other comorbidities. The reported high prevalence of depression needs to be thoughtfully weighed. We recommend periodic screening for depression every 6 to 12 months for all hemodialysis patients to allow early detection and appropriate management. Furthermore, future longitudinal, multicenter studies are needed to better understand the predictors, course, and impact of depression in this vulnerable population.

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